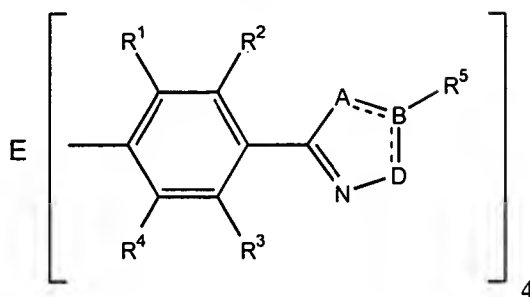


## WHAT IS CLAIMED IS:

1. A compound of the following formula:



wherein

each of  $R^1$ - $R^4$  is, independently, H, substituted or unsubstituted  $C_{1-6}$  alkyl, OH,  $C_{1-6}$  alkoxy,  $N(R^6)(R^7)$ , in which each of  $R^6$  and  $R^7$  is, independently, H or substituted or unsubstituted  $C_{1-6}$  alkyl,  $NO_2$ , CN, or  $CO_2R^8$ , in which  $R^8$  is H or  $C_{1-6}$  alkyl; and

wherein  $R^5$  is H, substituted or unsubstituted  $C_{1-6}$  alkyl, substituted or unsubstituted  $C_{2-6}$  alkenyl, substituted or unsubstituted  $C_{2-6}$  alkynyl, substituted or unsubstituted  $C_{6-20}$  aryl, substituted or unsubstituted alkylaryl, substituted or unsubstituted  $C_{4-20}$  heteroaryl,  $C_{10-20}$  diarylaminoaryl, or is absent, or B and D, together with  $R^5$  and  $R^{11}$ , are substituted or unsubstituted aryl;

wherein A is O, S,  $N(R^9)$  in which  $R^9$  is absent, H, substituted or unsubstituted alkyl, or substituted or unsubstituted aryl,  $N=N$ , or  $N=C(R^{10})$  in which the C is adjacent to B and in which  $R^{10}$  is substituted or unsubstituted alkyl, or substituted or unsubstituted aryl;

wherein B is C or N;

wherein D is N, NH, or  $C(R^{11})$  in which  $R^{11}$  is substituted or unsubstituted alkyl, or substituted or unsubstituted aryl, or B and D, together with  $R^5$  and  $R^{11}$  are substituted or unsubstituted aryl;

and wherein E is C or Si;

provided that when A is O and D is N, then B is C and the floating double bond is between B and D;

further provided that when A is  $N(R^9)$  and  $R^9$  is absent, then B is N,  $R^5$  is absent, D is NH, and the floating double bond is between A and B;

further provided that when A is  $N=N$ , then B is C, D is N, and the floating double bond is between B and D;

further provided that when A is  $N=C(R^{10})$ , then B is N,  $R^5$  is absent, D is  $C(R^{11})$ , and the floating double bond is between B and D;

further provided that when A is  $N(R^9)$  and  $R^9$  is H, alkyl, or aryl, then B is C, D is  $C(R^{11})$ , and the floating double bond is between B and D;

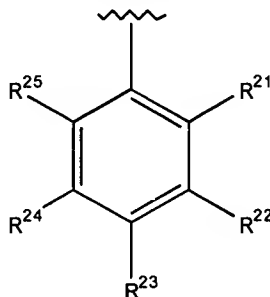
further provided that when A is O or S and D is  $C(R^{11})$ , then B is C and the floating double bond is between B and D.

2. The compound of claim 1, wherein A is O.

3. The compound of claim 2, wherein each of  $R^1$ - $R^4$  is H.

4. The compound of claim 2, wherein  $R^5$  is substituted or unsubstituted aryl, or substituted or unsubstituted alkylaryl.

5. The compound of claim 4, wherein  $R^5$  has the following formula:



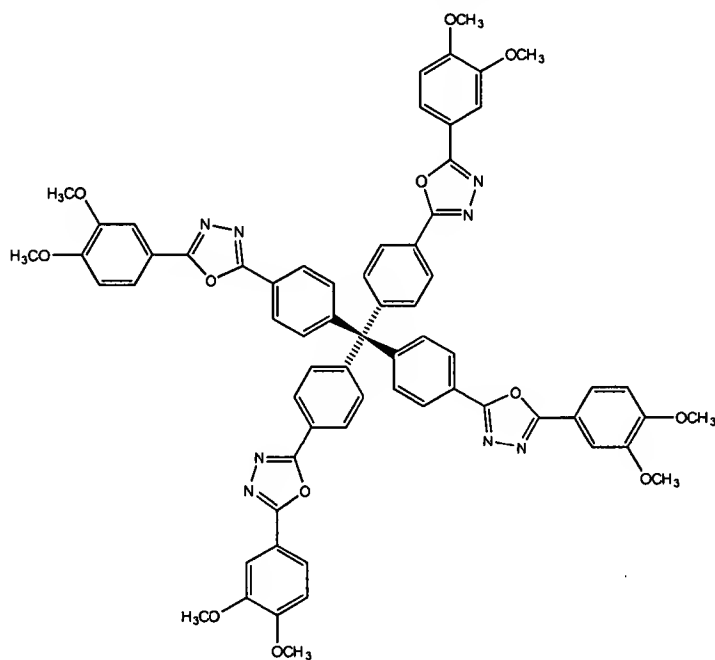
wherein each of  $R^{21}$ - $R^{25}$  is, independently, H, substituted or unsubstituted  $C_{1-6}$  alkyl, OH,  $C_{1-6}$  alkoxy,  $N(R^{26})(R^{27})$ , in which each of  $R^{26}$  and  $R^{27}$  is, independently, H, substituted or unsubstituted  $C_{1-6}$  alkyl, substituted or unsubstituted aryl, substituted or unsubstituted alkylaryl,  $NO_2$ , CN, or  $CO_2R^{28}$ , in which  $R^{28}$  is H or  $C_{1-6}$  alkyl.

6. The compound of claim 5, wherein each of  $R^{21}$ - $R^{25}$  is, independently, H or methoxy.

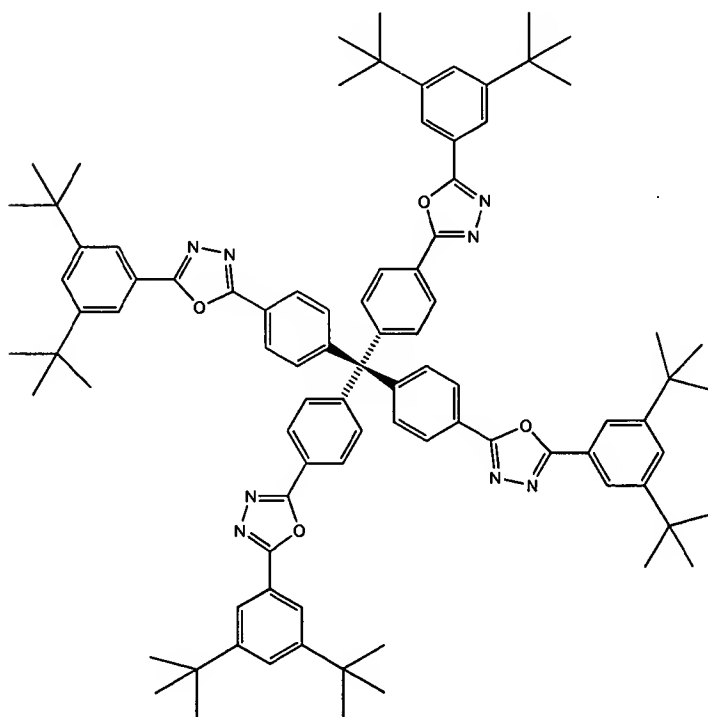
7. The compound of claim 5, wherein each of  $R^{21}$ - $R^{25}$  is, independently, H or tert-butyl.

60 8. The compound of claim 5, wherein each of  $R^{21}$ - $R^{25}$  is, independently, H or  
61 trifluoromethyl.

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63 9. The compound of claim 1, wherein the compound has the following formula:

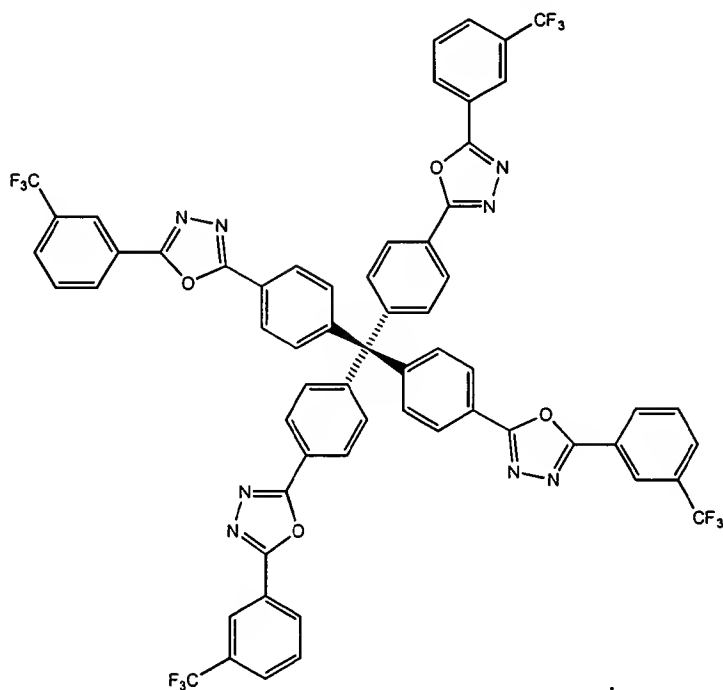


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65 10. The compound of claim 1, wherein the compound has the following formula:



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11. The compound of claim 1, wherein the compound has the following formula:



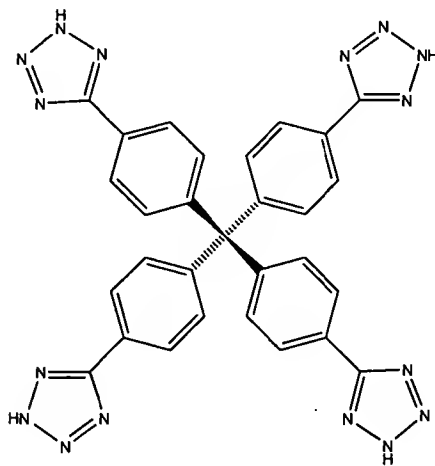
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12. The compound of claim 1, wherein A is  $N(R^9)$ , in which  $R^9$  is absent.

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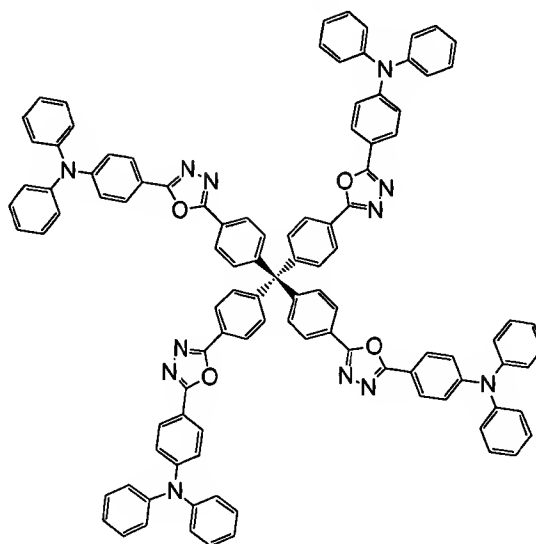
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13. The compound of claim 12, wherein the compound has the following formula:

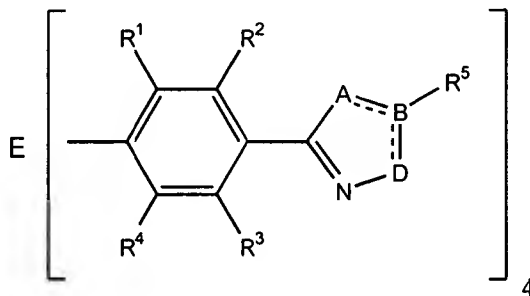


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14. The compound of claim 1, wherein the compound has the following formula:



15. An electroluminescence device comprising a substrate, a hole transporting layer, and emitting layer, and an electron transporting layer, wherein at least one of the hole transporting layer, the emitting layer, and the electron transporting layer comprises a compound having the following formula:



wherein

each of  $R^1$ - $R^4$  is, independently, H, substituted or unsubstituted  $C_{1-6}$  alkyl, OH,  $C_{1-6}$  alkoxy,  $N(R^6)(R^7)$ , in which each of  $R^6$  and  $R^7$  is, independently, H or substituted or unsubstituted  $C_{1-6}$  alkyl,  $NO_2$ , CN, or  $CO_2R^8$ , in which  $R^8$  is H or  $C_{1-6}$  alkyl; and

wherein  $R^5$  is H, substituted or unsubstituted  $C_{1-6}$  alkyl, substituted or unsubstituted  $C_{2-6}$  alkenyl, substituted or unsubstituted  $C_{2-6}$  alkynyl, substituted or unsubstituted  $C_{6-20}$  aryl, substituted or unsubstituted alkylaryl, substituted or unsubstituted  $C_{4-20}$  heteroaryl,  $C_{10-20}$  diarylaminoaryl, or is absent, or B and D, together with  $R^5$  and  $R^{11}$ , are substituted or unsubstituted aryl;

wherein A is O, S, N(R<sup>9</sup>) in which R<sup>9</sup> is absent, H, substituted or unsubstituted alkyl, or substituted or unsubstituted aryl, N=N, or N=C(R<sup>10</sup>) in which the C is adjacent to B and in which R<sup>10</sup> is substituted or unsubstituted alkyl, or substituted or unsubstituted aryl;

wherein B is C or N;

wherein D is N, NH, or C(R<sup>11</sup>) in which R<sup>11</sup> is substituted or unsubstituted alkyl, or substituted or unsubstituted aryl, or B and D, together with R<sup>5</sup> and R<sup>11</sup> are substituted or unsubstituted aryl;

and wherein E is C or Si;

provided that when A is O and D is N, then B is C and the floating double bond is between B and D;

further provided that when A is N(R<sup>9</sup>) and R<sup>9</sup> is absent, then B is N, R<sup>5</sup> is absent, D is NH, and the floating double bond is between A and B;

further provided that when A is N=N, then B is C, D is N, and the floating double bond is between B and D;

further provided that when A is N=C(R<sup>10</sup>), then B is N, R<sup>5</sup> is absent, D is C(R<sup>11</sup>), and the floating double bond is between B and D;

further provided that when A is N(R<sup>9</sup>) and R<sup>9</sup> is H, alkyl, or aryl, then B is C, D is C(R<sup>11</sup>), and the floating double bond is between B and D;

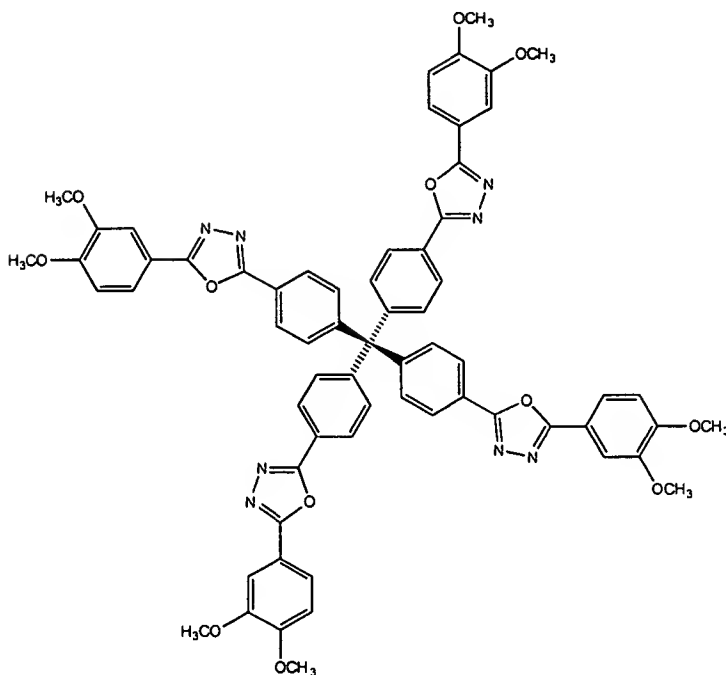
further provided that when A is O or S and D is C(R<sup>11</sup>), then B is C and the floating double bond is between B and D.

16. The device of claim 15, wherein A is O, B is C, and D is N.

17. The device of claim 16, wherein each of R<sup>1</sup>-R<sup>4</sup> is H.

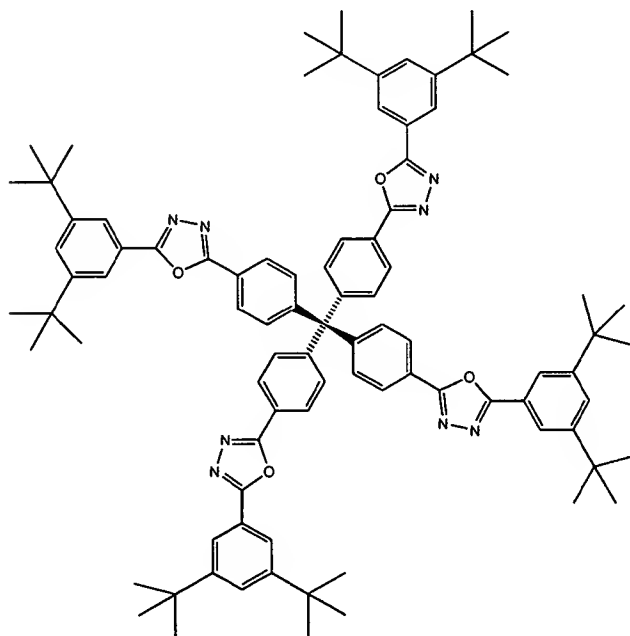
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18. The device of claim 15, wherein the compound has the following formula:



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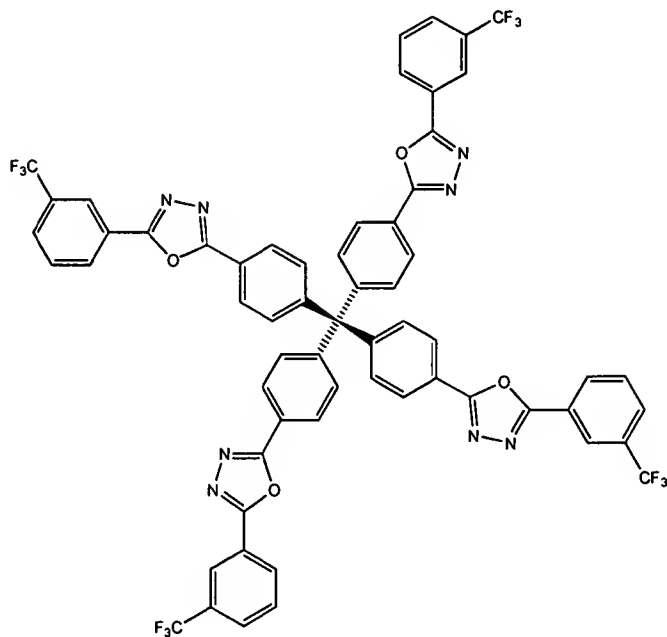
19. The device of claim 15, wherein the compound has the following formula:



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20. The device of claim 15, wherein the compound has the following formula:

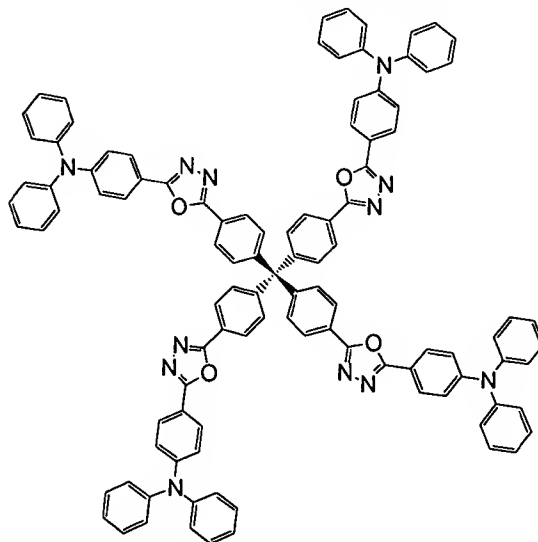


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21. The device of claim 14, wherein the compound has the following formula:



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